Patent claims

1. A circuit arrangement for operating high-pressure discharge lamps, the circuit arrangement having the following features,

- a voltage converter (S1, S2) for generating an AC voltage,
- a transformer (T1) having a secondary winding (T1b), which is connected to the voltage converter (S1, S2) or is formed as part of the voltage converter (S1, S2),
- a load circuit, which is fed by the secondary winding (T1b) of the transformer (T1) and has terminals for a high-pressure discharge lamp (La) and the ignition voltage output of a pulse ignition apparatus (IZV), which serves the purpose of igniting the gas discharge in the high-pressure discharge lamp (La),

characterized in that a series resonant circuit (L3, C4) or a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit or the combination of a series resonant circuit with a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit is provided for supplying voltage to the pulse ignition apparatus (IZV) during the ignition phase of the high-pressure discharge lamp (La).

2. The circuit arrangement as claimed in claim 1, characterized in that the series resonant circuit (L3, C4) is connected to the secondary winding (T1b) of the transformer (T1) and, when a high-pressure discharge lamp is connected, is connected in parallel with the discharge path of the high-pressure discharge lamp (La).

3. The circuit arrangement as claimed in claim 1, characterized in that the series resonant circuit is connected on the primary side to the transformer (T1).

4. The circuit arrangement as claimed in claim 3, characterized in that the resonant inductance of the series resonant circuit is in the form of an autotransformer

(L4, L4b), whose secondary winding (L4b) can be connected to the voltage input of a pulse ignition apparatus.

5. The circuit arrangement as claimed in claim 1, characterized in that a capacitor (C6) is arranged in the load circuit, is connected in series with the secondary winding (L2b) of the ignition transformer (T2) of the pulse ignition apparatus (IZV) when the pulse ignition apparatus (IZV) is connected and is dimensioned such that it essentially represents a short circuit for the ignition pulses generated by the pulse ignition apparatus (IZV) and, once the gas discharge in the high-pressure discharge lamp (La) has been ignited, brings about partial compensation of the inductance of the ignition transformer (L2b).

6. The circuit arrangement as claimed in claims 2 and 5, characterized in that the capacitor (C6) is formed as part of the series resonant circuit.

7. The circuit arrangement as claimed in claim 1, characterized in that the voltage-multiplying cascade circuit is supplied with energy during the ignition phase of the high-pressure discharge lamp (La) from the secondary winding (T1b) of the transformer (T1).

8. The circuit arrangement as claimed in claim 1, characterized in that the voltage input of the voltage-multiplying cascade circuit is connected into the voltage converter (S1, S2) on the primary side of the transformer (T1).

9. The circuit arrangement as claimed in claim 1, characterized in that the symmetrical voltage-doubling circuit is supplied with energy during the ignition phase of the high-pressure discharge lamp (La) from the secondary winding (T1b) of the transformer (T1).

10. The circuit arrangement as claimed in claim 1, characterized in that the voltage input of the symmetrical voltage-doubling circuit

is connected into the voltage converter (S1, S2) on the primary side of the transformer (T1).

11. The circuit arrangement as claimed in one or more of claims 1 to 10, characterized in that the voltage converter (S1, S2) is in the form of a current-fed push-pull converter.

12. A pulse ignition apparatus for igniting a gas discharge in a high-pressure discharge lamp, the pulse ignition apparatus (IZV) having a voltage input for its supply voltage,
characterized in that the pulse ignition apparatus (IZV) has a series resonant circuit (L3, C4), which is connected to the voltage input and is used for magnification of the supply voltage provided at the voltage input during the ignition phase, or has a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit or the combination of a series resonant circuit with a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit, whose output voltage is supplied to the ignition transformer (T2 or T3).

13. The pulse ignition apparatus as claimed in claim 12, characterized in that the pulse ignition apparatus (IZV) has a capacitor (C6), which is connected in series with the secondary winding (L2b) of the ignition transformer (T2) of the pulse ignition apparatus (IZV), is formed as part of the series resonant circuit (C5, C6, L3) and is dimensioned such that it essentially represents a short circuit for the ignition voltage pulses generated by the ignition apparatus (IZV) and, once the gas discharge in the high-pressure discharge lamp (La) has been ignited, brings about partial compensation of the inductance of the ignition transformer (L2b).

14. A high-pressure discharge lamp having a pulse ignition apparatus as claimed in claim 12 or 13 arranged in the lamp base.

15. A method for operating a high-pressure discharge lamp by means of a voltage converter and a pulse ignition apparatus, the supply voltage for the pulse ignition apparatus being generated with the aid of the voltage converter,
characterized in that, during the ignition phase of the high-pressure discharge lamp, an increase in the supply voltage for the pulse ignition apparatus is carried out with the aid of a series resonant circuit, which is operated close to its resonance, or a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit or by means of the combination of a series resonant circuit with a voltage-multiplying cascade circuit or a symmetrical voltage-doubling circuit.

16. The method as claimed in claim 15, characterized in that, once the gas discharge in the high-pressure discharge lamp has been ignited, the high-pressure discharge lamp is operated at AC voltages whose frequency is above the resonant frequency of the series resonant circuit.

17. The method as claimed in claim 15, characterized in that the voltage-multiplying cascade circuit is deactivated once the gas discharge in the high-pressure discharge lamp has been ignited.

18. The method as claimed in claim 15, characterized in that the symmetrical voltage-doubling circuit is deactivated once the gas discharge in the high-pressure discharge lamp has been ignited.